

CLAIMS

What is claimed is:

1. An energy absorbing system comprising:

5 an anchor;

a net mechanically coupled to the anchor; and

a support mechanically coupled to the net via a frangible connector,

wherein the frangible connector uncouples the support from the net upon application
of at least a threshold force to the frangible connector.

10

2. The energy absorbing system of claim 1, further comprising:

a second anchor mechanically coupled to the net; and

a second support mechanically coupled to the net,

wherein the first and second supports are arranged such that at least a portion of the

15 net between the first and second supports spans an area through which a vehicle may
pass.

3. The energy absorbing system of claim 2, wherein the area through which a

vehicle may pass is a roadway.

20

4. The energy absorbing system of claim 1, further comprising:

a sleeve rotatably mechanically coupled to the anchor and mechanically coupled to
the net.

5. The energy absorbing system of claim 1, wherein the anchor and the support are arranged such that at least a portion of the net between the anchor and the support is substantially parallel to a likely direction of a vehicle to be stopped by the energy
5 absorbing system.

6. The energy absorbing system of claim 1, wherein a cable end of the net is mechanically coupled to a prong of a joint which is coupled to the anchor.

10 7. The energy absorbing system of claim 1, wherein the net in a quiescent state exerts a static tensile force, and the threshold force relating to the frangible connector is greater than the static tensile force

8. The energy absorbing system of claim 1, wherein the frangible connector includes
15 a cable.

9. The energy absorbing system of claim 1, wherein the support may be raised and lowered, thereby raising and lowering the net.

20 10. The energy absorbing system of claim 1, wherein the support includes a post which may be raised and lowered, thereby raising and lowering the net.

11. The energy absorbing system of claim 10, wherein the post has a distal end which, when lowered, is directed toward the anchor.

12. The energy absorbing system of claim 10, further comprising:
5 a post raise-lowering mechanism.

13. The energy absorbing system of claim 12, wherein the post raise-lowering mechanism includes a spring.

10 14. The energy absorbing system of claim 12, wherein the post raise-lowering mechanism includes a motor.

15 15. The energy absorbing system of claim 12, wherein the post raise-lowering mechanism is controlled by a user.

16. The energy absorbing system of claim 12, wherein the post raise-lowering mechanism is controlled by a train-sensing mechanism.

17. The energy absorbing system of claim 12, wherein the post raise-lowering
20 mechanism is controlled by a security system.

18. The energy absorbing system of claim 1, wherein the net includes a top cable and a bottom cable coupled by a plurality of vertical cables.

19. The energy absorbing system of claim 18, wherein the plurality of vertical cables are mechanically coupled to a center cable.

20. The energy absorbing system of claim 1, further comprising:
5 a crossbar mechanically coupling points of two or more cables included in the net.

21. The energy absorbing system of claim 1, further comprising:
an energy absorber mechanically coupling the net and the anchor.

10 22. The energy absorbing system of claim 21, wherein the energy absorber is a shock absorber.

23. The energy absorbing system of claim 21, wherein the energy absorber is a braking mechanism.

15 24. The energy absorbing system of claim 21, further comprising:
a sleeve rotatably mechanically coupled to the anchor and mechanically coupled to the energy absorber.

20 25. The energy absorbing system of claim 21, wherein the energy absorber extends in a direction substantially parallel to a likely direction of a vehicle to be stopped by the energy absorbing system.

26. The energy absorbing system of claim 21, further comprising:

a crossbar mechanically coupling points of two or more energy absorbers arranged on an anchor.

5 27. The energy absorbing system of claim 21, further comprising:

a joint mechanically coupling the energy absorber and the anchor,
wherein the joint pivots on a horizontal axis.

28. The energy absorbing system of claim 27, wherein the joint includes a stop plate,

10 which prevents the joint from pivoting beyond a predetermined angle.

29. The energy absorbing system of claim 27, further comprising:

a sleeve rotatably mechanically coupled to the anchor and mechanically coupled to
the joint.

15

30. The energy absorbing system of claim 27, further comprising:

a crossbar mechanically coupling points of two or more joints.

31. The energy absorbing system of claim 1, wherein the net is mechanically coupled

20 to the anchor at a point below ground level.

32. The energy absorbing system of claim 1, wherein the anchor is mechanically

coupled to the net via a socket.

33. The energy absorbing system of claim 1, wherein net is mechanically coupled to the anchor at a point at ground level.

5 34. The energy absorbing system of claim 1, wherein net is mechanically coupled to the anchor at a point above ground level.

35. The energy absorbing system of claim 1, wherein the anchor is a stanchion.

10 36. An energy absorbing system comprising:

an anchor;

a first energy absorber mechanically coupled to the anchor;

a second energy absorber mechanically coupled to the anchor;

a net mechanically coupled to the first and second energy absorbers; and

15 a support mechanically coupled to the net via a frangible connector,

wherein the frangible connector uncouples the support from the net upon application of at least a threshold force to the frangible connector.

37. The energy absorbing system of claim 36, wherein the support may be raised and
20 lowered, thereby raising and lowering the net.

38. The energy absorbing system of claim 36, further comprising:

a second anchor coupled to the net; and

a second support coupled to the net,

wherein the first and second supports are arranged such that at least a portion of the net between the first and second supports spans an area through which a vehicle may pass.

5

39. The energy absorbing system of claim 36, further comprising:

a sleeve rotatably mechanically coupled to the anchor and mechanically coupled to the first and second energy absorber.

10

40. The energy absorbing system of claim 36, further comprising:

a first and second joint mechanically coupling each of the first and second energy absorbers to the anchor,

wherein the first and second joints pivot on a horizontal axis.

15

41. The energy absorbing system of claim 36, further comprising:

a crossbar connected to the first and second energy absorbers.

42. An energy absorbing system comprising:

an anchor;

20

a sleeve rotatably mechanically coupled to the anchor;

a net mechanically coupled to the sleeve; and

a support mechanically coupled to the net via a frangible connector,

wherein the frangible connector uncouples the support from the net upon application of at least a threshold force to the frangible connector, and

wherein the support may be raised and lowered, thereby raising and lowering the net.

5 43. The energy absorbing system of claim 42, further comprising:

a second anchor coupled to the net; and

a second support coupled to the net,

wherein the first and second supports are arranged such that at least a portion of the net between the first and second supports spans an area through which a vehicle may

10 pass.

44. The energy absorbing system of claim 42, further comprising:

an energy absorber mechanically coupling the sleeve and the net.

15 45. The energy absorbing system of claim 44, further comprising:

a joint mechanically coupling the energy absorber and the anchor,

wherein the joint pivots on a horizontal axis.

46. A method for absorbing the energy of an errant vehicle, comprising:

20 positioning a net across an area through which the vehicle is expected to pass, the net

being mechanically coupled to an anchor; and

mechanically coupling the net to a support through a frangible connector,

wherein the frangible connector uncouples the support from the net upon application of at least a threshold force to the frangible connector by the vehicle and the force of the vehicle is transferred through the net to the anchor.

5 47. The energy absorbing method of claim 46, further comprising:
mechanically coupling the net to a second support,
wherein the net is mechanically coupled to a second anchor, and
wherein the first and second supports are arranged such that at least a portion of the
net between the first and second supports spans an area through which a vehicle may
10 pass.

48. The energy absorbing method of claim 47, wherein the area through which a vehicle may pass is a roadway.

15 49. The energy absorbing method of claim 46, wherein a sleeve is rotatably mechanically coupled to the anchor and mechanically coupled to the net.

50. The energy absorbing method of claim 46, further comprising:
arranging the support such that at least a portion of the net between the anchor and
20 the support is substantially parallel to a likely direction of a vehicle to be stopped.

51. The energy absorbing method of claim 46, wherein a cable end of the net is mechanically coupled to a prong of a joint which is coupled to the anchor.

52. The energy absorbing method of claim 46, wherein the net in a quiescent state exerts a static tensile force, and the threshold force relating to the frangible connector is greater than the static tensile force.

5

53. The energy absorbing method of claim 46, further comprising:
attaching a cable as a frangible connector.

54. The energy absorbing method of claim 46, further comprising:
10 changing a height of a post of the support, thereby changing a height of the net.

55. The energy absorbing method of claim 54, further comprising:
lowering the height of the distal end of the post in a direction of the anchor.

15 56. The energy absorbing method of claim 54, further comprising:
changing the height of the post using a spring mechanism.

57. The energy absorbing method of claim 54, further comprising:
changing the height of the post using a motor mechanism.

20

58. The energy absorbing method of claim 54, further comprising:
changing the height of the post based on input from a user.

59. The energy absorbing method of claim 54, further comprising:

changing the height of the post based on input from a train-sensing mechanism.

60. The energy absorbing method of claim 54, further comprising:

5 changing the height of the post based on input from a security system.

61. The energy absorbing method of claim 46, wherein the net includes a top cable
and a bottom cable coupled by a plurality of vertical cables.

10 62. The energy absorbing method of claim 61, wherein the plurality of vertical cables
are mechanically coupled to a center cable.

63. The energy absorbing method of claim 46, further comprising:

15 attaching a crossbar mechanically coupling points of two or more cables included in
the net.

64. The energy absorbing method of claim 46, wherein an energy absorber
mechanically couples the net and the anchor.

20 65. The energy absorbing method of claim 64, wherein a sleeve rotatably
mechanically couples the anchor and the energy absorber.

66. The energy absorbing method of claim 64, wherein the energy absorber extends in a direction substantially parallel to a likely direction of a vehicle to be stopped.

67. The energy absorbing method of claim 64, further comprising:

5 attaching a crossbar mechanically coupling points of two or more energy absorbers arranged on an anchor.

68. The energy absorbing method of claim 64, wherein a joint mechanically couples the energy absorber and the anchor, and

10 wherein the joint pivots on a horizontal axis.

69. The energy absorbing method of claim 68, wherein the joint includes a stop plate which prevents the joint from pivoting beyond a predetermined angle.

15 70. The energy absorbing method of claim 68, wherein a sleeve rotatably mechanically couples the anchor and the joint.

71. The energy absorbing method of claim 68, further comprising:

attaching a crossbar mechanically coupling points of two or more joints.

20

72. A method for absorbing the energy of an errant vehicle, comprising:

positioning a net across an area through which the vehicle is expected to pass, the net being mechanically coupled to an anchor;

mechanically coupling the net to a support through a frangible connector; and
changing the height of a support, thereby changing the height of the net,
wherein the frangible connector uncouples the support from the net upon application
of at least a threshold force to the frangible connector by the vehicle,
5 wherein the force of the vehicle is transferred through the net to the anchor,
wherein a sleeve rotatably mechanically couples the anchor and a joint, and
wherein an energy absorber mechanically couples the net and the joint.

73. An energy absorbing system comprising:

10 means for absorbing energy;

means for restraining a vehicle, the restraining means being connected to the energy
absorbing means to enable the transfer of energy from a vehicle impacting the restraining
means to the energy absorbing means; and

means for supporting the restraining means in a position likely to be impacted by an
15 errant vehicle until the application of at least a threshold force by the vehicle to the
restraining means.

74. The energy absorbing system of claim 73, further comprising:

means for permitting the restraining means to rotate about the energy absorbing
20 means.

75. The energy absorbing system of claim 73, further comprising:

means for pivoting the restraining means on a horizontal axis.

76. The energy absorbing system of claim 73, further comprising:

means for raising and lowering the supporting means.

5 77. An energy absorbing system comprising:

an anchor;

a net mechanically coupled to the anchor; and

a support mechanically coupled to the net,

wherein the anchor and the support are arranged such that at least a portion of the net

10 between the anchor and the support is substantially parallel to a likely direction of a
vehicle to be stopped by the energy absorbing system.

78. The energy absorbing system of claim 77, further comprising:

an energy absorber mechanically coupling the net and the anchor.

15

79. The energy absorbing system of claim 78, wherein the energy absorber is
arranged in a direction not substantially perpendicular to a likely direction of a vehicle to
be stopped by the energy absorbing system.

20 80. The energy absorbing system of claim 78, further comprising:

a sleeve rotatably mechanically coupled to the anchor and mechanically coupled to
the energy absorber.

81. The energy absorbing system of claim 78, wherein the energy absorber extends in a direction substantially parallel to a likely direction of a vehicle to be stopped by the energy absorbing system.

5 82. The energy absorbing system of claim 78, further comprising:
a crossbar mechanically coupling points of two or more energy absorbers arranged on an anchor.

83. The energy absorbing system of claim 78, further comprising:
10 a joint mechanically coupling the energy absorber and the anchor.

84. The energy absorbing system of claim 83, wherein the joint pivots on an axis, and includes a stop plate, which prevents the joint from pivoting beyond a predetermined angle.

15 85. The energy absorbing system of claim 77, wherein the support is mechanically coupled to the net via a non-frangible connector.

86. The energy absorbing system of claim 85, wherein the non-frangible connector
20 expands upon application of at least a threshold force to the non-frangible connector.

87. The energy absorbing system of claim 85, wherein the non-frangible connector contracts upon application of at least a threshold force to the non-frangible connector.

88. The energy absorbing system of claim 77, wherein the support includes a section mechanically coupled to the net, and the section separates from the support upon application of at least a threshold force to the section.

5

89. The energy absorbing system of claim 77, further comprising:

a second anchor coupled to the net; and

a second support coupled to the net,

wherein the first and second supports are arranged such that at least a portion of the

10 net between the first and second supports spans an area through which a vehicle may pass.

90. The energy absorbing system of claim 77, further comprising:

a first energy absorber mechanically coupling the net and the anchor;

15 a second anchor mechanically coupled to the net via a second energy absorber; and

a second support mechanically coupled to the net,

wherein the first and second energy absorbers are arranged in a direction not substantially perpendicular to a likely direction of a vehicle to be stopped by the energy absorbing system.

20

91. The energy absorbing system of claim 90, further comprising:

a first sleeve rotatably mechanically coupled to the anchor and mechanically coupled to the first energy absorber,

wherein the first sleeve rotates about an axis of the anchor when a force is applied to the net.

92. An energy absorbing system comprising:

5 an anchor; x_b

a net mechanically coupled to the anchor; and

a support mechanically coupled to the net,

wherein the anchor and the support are arranged such that at least a portion of the net between the anchor and the support is not substantially perpendicular to a likely direction

10 of a vehicle to be stopped by the energy absorbing system.--